

University of California, Davis  
Department of Biomedical Engineering

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Winter 2026      Advanced Design of Experiments      BIM 283  
David M. Rocke      for Biomedical Engineers      January 26, 2026

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**Homework Assignment 3**

*Due February 11, 2026*

The data for problems 3.8, 3.15, 4.1, and 4.2 are in the zipped data file.

1. Do problem 3.1 in the text. Use `t.test()` with the default options.
2. Do problem 3.8 in the text. Use a paired t-test on the differences by using a one sample t-test with `t.test()` with the default options. You can also do this problem as a block design using `lm()` with two predictors, tube, and compartment (A/B). Compare the results.
3. Do problem 3.15 in the text. Use `t.test()` with the default options.
4. Do problem 4.1 in the text. You do not need to do the “graphical analysis” in part b). Part c) is not well specified, so instead, find confidence intervals for the 6 differences in suppliers. Three of them are in the output of `lm()` and the other three can be computed using `coef()` and `vcov()`.

$$\text{Var}(A - B) = \text{Var}(A) + \text{Var}(B) - 2\text{Cov}(A, B)$$

5. Do problem 4.2 in the text. You do not need to do the “graphical ANOVA”.